WHAT IS CLAIMED IS:

1. An optical fiber coupler comprising:

a plurality of optical fibers including a λ_1-band optical fiber and a λ_2-band optical fiber, fused together at a fusion-elongated portion, wherein, in the fusion-elongated portion, each of the plurality of optical fibers tapers to a respective narrower outer diameter, relative to an outer diameter of the optical fiber outside the fusion-elongated portion,

wherein the λ_1-band is different from the λ_2-band, and

wherein a propagation constant difference between the optical fibers is 10^{-4} rad/μm or smaller.

2. An optical fiber coupler comprising:

a plurality of optical fibers including a λ_1-band optical fiber and a λ_2-band optical fiber, fused together at a fusion-elongated portion, wherein, in the fusion-elongated portion, each of the plurality of optical fibers tapers to a respective narrower outer diameter, relative to an outer diameter of the optical fibers outside the fusion-elongated portion,

wherein the λ_1-band is different from the λ_2-band, and

wherein at least outside the fusion-elongated portion, the λ_1-band optical fiber is a single mode optical fiber at a wavelength in the vicinity of 0.98 μm,

wherein at least outside the fusion-elongated portion, the λ_1-band optical fiber comprises a first core, a second core surrounding the first core and having a radius within the range of 10 μm or greater, and a cladding surrounding the second core, and

wherein a relative refractive-index difference of the second core and the cladding is 0.1 % or smaller.

3. An optical fiber coupler according to claim 2, wherein a relative refractive-index difference of the first core and the cladding is within a range from 0.7 % to 0.9 %.

4. An optical fiber coupler according to claim 3, wherein the λ_2-band optical fiber is a single mode optical fiber at a wavelength in the vicinity of 1.55 μm.

5. An optical fiber coupler according to claim 2, wherein a relative refractive-index difference of the first core and the cladding is within a range from 0.6 % to 0.8 %.

6. An optical fiber coupler according to claim 5, wherein the λ_2-band optical fiber is a single mode optical fiber at a wavelength in the vicinity of 1.55 μm.

7. An optical fiber for an optical fiber coupler comprising:

a first core;

a second core surrounding the first core and having a radius within the range of 10 μm or greater; and

a cladding surrounding the second core,

wherein a relative refractive-index difference of the second core and the cladding is 0.1 % or smaller, and

wherein the optical fiber for the optical fiber coupler is a single mode optical fiber at a wavelength in the vicinity of 0.98 μm.

8. An optical fiber for an optical fiber coupler according to claim 7, wherein a relative refractive-index difference of the first core and the cladding is within a range from 0.7 % to 0.9 %.

9. An optical fiber for an optical fiber coupler according to claim 7, wherein the refractive-index difference of the first core and the cladding is within a range from 0.6 % to 0.8 %.

10. An optical fiber coupler comprising:

a λ_1-band optical fiber having a first core with a radius of r_1, a second core with a radius of r_2 surrounding the first core, and a cladding surrounding the second core;

a λ_2-band optical fiber including a core with a radius of r_3, and a cladding surrounding the core; and

a fusion-elongated portion where the λ_1-band optical fiber and the λ_2-band optical fiber are fused together, each of the optical fibers in the fusion-elongated portion tapering to a respective narrower outer diameter, relative to an outer diameter of the optical fibers outside the fusion-elongated portion,

wherein the λ_1-band is lower in wavelength than the λ_2-band, and

wherein $r_1 < r_3 \leq r_2$.

11. An optical fiber coupler according to claim 10, wherein a propagation constant difference between the λ_1-band optical fiber and the λ_2-band optical fiber is 10^{-4} rad/μm or smaller.

12. An optical fiber coupler according to claim 10, wherein a relative refractive-index difference of the second core and the cladding of the λ_1-band optical fiber is 0.1 % or smaller.

13. An optical fiber coupler according to claim 10, wherein a relative refractive-index difference of the first core and the cladding of the λ_1-band optical fiber is within a range from 0.7 % to 0.9 %.

14. An optical fiber coupler according to claim 10, wherein said λ_1-band optical fiber is a single mode optical fiber at a wavelength in the vicinity of 0.98 μm, and said λ_2-band optical fiber is a single mode optical fiber at a wavelength in the vicinity of 1.55 μm.